Original Article

The Result of Conservative Management for Postoperative Seroma Following Laparoscopic Ventral Hernia Repair [LVHR]

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Background: Laparoscopic ventral hernia repair [LVHR] with mesh showed lower recurrent rate than suture repair, especially in defect size larger than 2 cm. Postoperative seroma formation was variable.

Materials and Methods: A retrospective descriptive review of 110 patients that received LVHR with mesh in King Chulalongkorn Memorial Hospital between January 2007 and December 2013 from collected database and medical records was done.

Results: The mean size of ventral hernia defect was 55 cm^2 (range 4 to 300 cm^2). Seven to fourteen days after LVHR, the seroma had been detected by clinical diagnosis in 19 patients (17.2%). Conservative management was success in 16 patients (84.2%). The mean size of seroma was 4.5 cm in diameter (range 2 to 10 cm), and the mean conservative time was two months. However, the conservative management failed in three patients (15.8%). Two patients (10.5%) received aspirated seroma at two and six months after conservative. Only one patient (5.3%) had infected seroma, managed by surgical drainage and mesh removal.

Conclusion: Almost all patients with postoperative seroma following LVRH were asymptomatic, could be observed safely, and succeeded conservative treatment within two months after operation. However, it might be necessary to perform interventional or surgical treatment if seroma was symptomatic, persisted more than two months, or became infected.

Keywords: Laparoscopic ventral hernia repair, Laparoscopic IPOM, Postoperative seroma

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An abdominal wall hernia is the protrusion of intraabdominal organs or tissue through a defect at the abdominal wall. Abdominal wall hernias can be classified into primary ventral and incisional hernia. Hernias can cause pain or discomfort, and can give rise to serious complications such as visceral organ ischemia and gangrene. Therefore, all abdominal wall hernias should be corrected by surgical means. The ventral hernia repair can be performed by either primary closure or mesh repair. In primary repair group, recurrent herniation is reported to occur in 30% to 50% of the cases[1]. Creating a tension-free repair with a prosthetic material has lowered the recurrence rate to 15% to 30%[2], especially in hernia defect larger than 2 cm. However, there are potential complication such as seroma, hematoma, mesh infection, chronic pain, and stiffness of the abdominal wall after prosthetic mesh repaired.

In ventral hernia repair with prosthetic mesh group, the laparoscopic technique demonstrated similar recurrence rates as open mesh techniques, but improved the results (less wound complications and shorter hospital stay)[3]. However, many complications have been documented in laparoscopic ventral hernia repair [LVHR]. Those include persistent seroma, mesh infection, hematoma, and persistent postoperative pain.

Seroma formation is caused by tissue reaction between the surface area of the mesh and the abdominal wall. The nature of the laparoscopic approach leaves a potential space between the mesh and the overlying skin and parietal peritoneum. This space can easily accumulate some fluid. The incidence of seroma after LVHR is variable (0.5% to 35%). Some studies demonstrated a radiographic seroma rate of up to 100%[4,5]. Most of seroma are asymptomatic and resolve spontaneously. Conservative management for seroma is recommended. The intervention or surgical management may be considered in patients with persistent seroma, significant symptom of pain and pressure, or infection. The present study was designed to evaluate the result of the conservative treatment of seroma after LVHR.

Materials and Methods

The medical records of 110 patients that underwent LVHR for ventral hernia of anterior abdominal wall

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between January 2007 and December 2013 at the Department of Surgery, King Chulalongkorn Memorial Hospital were reviewed retrospectively. The patients age 15 or older who were performed the elective LVHR with collagen coated polyester mesh were included in the present study. Two patients converted to opened hernia repair and were excluded. Medical records were reviewed for patient demographics, comorbidities, hernia characteristics, surgical histories, operative details, postoperative outcome, seroma formation, and treatment. The proportional data were presented as percentages and continuous data were presented as mean and standard deviation [SD].

Operative technique

LVHR was performed by intraperitoneal onlay mesh [IPOM] technique, with 3 to 5 cm overlapping the abdominal wall from the borders of the hernia defect.

The mesh was fixed by transfascial suture and tacks applied every centimeter along the mesh border. A variety of meshes were used for repair according to surgeon preference.

Follow-up evaluation

Patients were examined postoperatively at 7 to 14 days, 1 to 6 months, and thereafter as clinically indicated. Seroma was diagnosed by physical examination without radiographic confirmation.

Results

The demographic features of the 110 patients that underwent LVHR are listed in Table 1. The mean patient age was 56. Sixty-eight percent of the patients were female and 32% were male. Average BMI was 25.5 (18.0 to 63.0). Eighteen cases (17.3%) had prior ventral hernia repaired. Thirty-four percent developed incisional hernia after cancer surgery.

Table 1. Patient demographics data (n = 110)

Age (year), median (range)	56 (32 to 85)
Sex: male (%)	32.4
BMI (kg/m^2), median (range)	25.5 (18.0 to 63.0)
DM (%)	24.5
Coronary artery disease (%)	4.5
Patient with prior repair (%)	17.3
Prior surgery for cancer (%)	34.0

BMI = body mass index; DM = diabetes mellitus

The average size of ventral hernia defect was 55 cm^2 (range 4 to 300 cm^2). The mean operative time was 95 minutes (40 to 345 minutes). Seven to fourteen days after LVHR, seroma had been detected by clinical diagnosis in 19 patients (17.2%). The average size of defect in seroma patient is higher than non-seroma patient (Table 2).

The mean size of seroma was 4.5 cm in diameter (range 2 to 10 cm). Conservative management with only observation was successful in 16 patients (84.2%), and the mean conservative time was two months. However, the conservative management failed in three patients (15.8%). The first patient has persistent seroma with significant symptom of pain. The seroma was aspirated at two months. The second patient had persistent seroma and was aspirated at six months after LVHR. There was no complication after aspiration in both patients. Only one patient (5.3%) had infected seroma. The culture found S. aureus infection, managed by surgical drainage and mesh removal (Table 3).

Discussion

The laparoscopic approach for ventral hernia repair was first introduced by LeBlanc and Booth in 1993[6]. The use of mesh during laparoscopic hernia repair is associated with lower rate of wound

Table 2. Demographic data of non-seroma and seroma patients

Patient (n = 110)	BMI (kg/m^2), mean ± SD	Defect size (cm^2), mean ± SD	Redo operation	Type of mesh
Non-seroma (n = 91)	24.1±4.2	49.3±29.1	10	Collagen coated polyester
Seroma (n = 19)	26.7±8.1	78.4±41.8	8	Collagen coated polyester

BMI = body mass index

Table 3. Data of postoperative persisted seroma patient

Patient with seroma	BMI (kg/m^2)	Defect size (cm^2)	Redo operation	Mesh removal
A: non-infected	42	171	No	No
B: non-infected	38	180	Yes	No
C: infected seroma	47	119	Yes	Yes

BMI = body mass index

infection and shorter hospital stay than open technique. In LVHR, a mesh is placed to cover the hernia defect. The hernia sac is left untouched and thereby fluids can collect in the hernia sac, between peritoneum and parietal surface of mesh, resulting in a seroma. Inflammatory reaction to the implanted material and hematoma may contribute to the formation of a seroma. The real incidence of seroma after this procedure is difficult to be determined due to heterogeneous definition, method, and time of measurement. Different studies have shown varying rate of seroma formation from 0.5% to 35%. One study reported that the incident was 100% in patients followed with ultrasound examination[4]. In the present study, seroma formation was found in 19 cases (17.2%) by clinical examination.

According to Society of the American Gastrointestinal and Endoscopic Surgeons [SAGES] guideline for laparoscopic ventral hernia repair 2016, most of seroma are treated conservatively. However, they did not confirm the exact period of this conservative management. Aspiration may be considered when there are significant symptoms of pain and pressure. With persistent seroma, there was no exact recommended period of treatment[7-10]. Imaging may be obtained if there was any concern over a recurrence. From 19 seroma patients, seroma could not be detected by physical examination within two months after operation in 16 patients (84.2%). Two patients (10.5%) was aspirated seroma due to significant pain and persistent seroma at two and six months, respectively. One patient developed infected seroma managed by surgical drainage and mesh removal. As a result, aspiration of postoperative seroma following LVHR may be considered if the seroma persists for more than two months.

Conclusion

Most of the postoperative seroma following LVHR were asymptomatic and can be managed safely with conservative treatment and need not to be clinically observed within two months. However, it may be necessary to perform intervention or surgical procedure if seroma was symptomatic, persisted more than two months, or became infected.

What is already known on this topic?

Clinical incidence of postoperative seroma following laparoscopic ventral hernia repair is variable. Some of seroma was treated with external compression, aspiration, or surgical removal.

In 2016, according to the SAGES guideline for laparoscopic ventral hernia repair, postoperative seroma is common and predicted. Most of seroma are treated conservatively but did not demonstrated the exact period of the conservative management.

What this study adds?

The recommended management of postoperative seroma LVHR following SAGES guideline did not clarify the beginning and the end of conservative treatment.

In this study, 19 patients (17.2%) had seroma at two weeks after operation. Seroma in most patients were asymptomatic and could not be detected clinically after conservative treatment within two months. Symptomatic, persistent, or infected seroma after two months may need interventional or surgical procedure.

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Potential conflicts of interest

The authors declare no conflict of interest.

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